

# Course Syllabus

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EEE 6374, Spring 2017

Radio Frequency Circuits and Systems

Instructor

Dr. Joaquin Casanova

NEB 565

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When sending email, add [EEE6374] in the subject line.

Class Time and Room

MWF 9 @LAR330

Office Hours

MWF 2-3pm, NEB 513

Class Website

on E-Learning (Sakai) <http://elearning.ufl.edu/>

Textbooks

My own lecture notes, plus two recommended textbooks:

Recommended: Pozar, Microwave and RF Design of Wireless Systems

Recommended: Razavi, RF Microelectronics, 2/E

Objectives

The course objective is to let students learn:

- Overall picture of RFIC and wireless systems
- RFIC specifications and system specifications
- Transceiver architectures

- How to derive RFIC specifications from wireless communication standards
- Design and simulation of RF transceivers using EDA tools

Click the link to get more information about this course: <http://www.lin.ece.ufl.edu/?q=EEE6374>

## Outline

RF Overview – Definition of RF and FCC Regulations

RF Propagation and Antennas

Wireless Standards, Digital Modulations

RF System-Level Specifications

Noise and Linearity in Receiver

RF Transceiver Architectures – Receiver and Transmitter

RF System Design EDA Tutorial

RFIC Specifications, Case Study

Emerging Applications

Overview of RFIC Technologies, Packaging, and System Integration

RF Testing – Spectrum Analyzer

## Grading

Homework/Quiz: 25% (Late submitted homework will not be graded. Random in-class quizzes.)

Exam #1: 25% (2/17)

Exam #2: 25% (4/6)

Final Project: 25% (Assignment will be announced after Exam #1)

No Final Exam.

Exam makeups can only be scheduled before the exam with appropriate justifications and supporting documents.

Points to Letter Grade conversion:

[90, 100] A

[86.67, 90) A-

[83.33, 86.67) B+

[80, 83.33) B

[76.67, 80) B-

[73.33, 76.67) C+

[70, 73.33) C

[66.67, 70) C-

[63.33, 66.67) D+

[60, 63.33) D

[0, 60) F

Note: If the average is below 83.33, the conversion scale will change.

Note: In order to graduate, graduate students must have an overall GPA and an upper-division GPA of 3.0 or better (B or better).

Note: a B- average is equivalent to a GPA of 2.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit:

<http://gradschool.ufl.edu/catalog/current-catalog/catalog-general-regulations.html#grades>

Academic Honesty

Follow UF Student Conduct & Honor Code:

<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>

Accommodations for Students with Disabilities

Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation

Important Classroom Rules

Cellular phones, pagers, and other electronic devices that may generate ring tones or sounds must be turned off during the class.


Software Use








All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

## Course Summary:

**Date**

**Details**

Date	Details	
Wed Jan 11, 2017	 <a href="https://ufl.instructure.com/courses/336010/assignments/3165519">HW #1 (https://ufl.instructure.com/courses/336010/assignments/3165519)</a>	due by 4pm
Fri Jan 20, 2017	 <a href="https://ufl.instructure.com/courses/336010/assignments/3165520">HW #2 (https://ufl.instructure.com/courses/336010/assignments/3165520)</a>	due by 4pm
Wed Feb 1, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=519975&amp;include_contexts=course_336010">Modulation I (https://ufl.instructure.com/calendar?event_id=519975&amp;include_contexts=course_336010)</a>	12am
Fri Feb 3, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=519976&amp;include_contexts=course_336010">Modulation II (https://ufl.instructure.com/calendar?event_id=519976&amp;include_contexts=course_336010)</a>	12am
Mon Feb 6, 2017	 <a href="https://ufl.instructure.com/courses/336010/assignments/3165523">HW #3 (https://ufl.instructure.com/courses/336010/assignments/3165523)</a>	due by 4pm
Mon Feb 6, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=519978&amp;include_contexts=course_336010">Licensed operation I (https://ufl.instructure.com/calendar?event_id=519978&amp;include_contexts=course_336010)</a>	12am
Wed Feb 8, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=537027&amp;include_contexts=course_336010">Multiple Access (https://ufl.instructure.com/calendar?event_id=537027&amp;include_contexts=course_336010)</a>	12am
Wed Feb 8, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=530446&amp;include_contexts=course_336010">Unlicensed operation II (https://ufl.instructure.com/calendar?event_id=530446&amp;include_contexts=course_336010)</a>	12am
Fri Feb 10, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=539512&amp;include_contexts=course_336010">Wireless RAN (https://ufl.instructure.com/calendar?event_id=539512&amp;include_contexts=course_336010)</a>	12am
Mon Feb 13, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=530444&amp;include_contexts=course_336010">ADS (https://ufl.instructure.com/calendar?event_id=530444&amp;include_contexts=course_336010)</a>	12am
Wed Feb 15, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=519982&amp;include_contexts=course_336010">Exam Review (https://ufl.instructure.com/calendar?event_id=519982&amp;include_contexts=course_336010)</a>	12am
Fri Feb 17, 2017	 <a href="https://ufl.instructure.com/courses/336010/assignments/3165527">Exam #1 (https://ufl.instructure.com/courses/336010/assignments/3165527)</a>	due by 4pm
Mon Feb 20, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=538826&amp;include_contexts=course_336010">Exam recap (https://ufl.instructure.com/calendar?event_id=538826&amp;include_contexts=course_336010)</a>	12am
Wed Feb 22, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=530449&amp;include_contexts=course_336010">Noise I (https://ufl.instructure.com/calendar?event_id=530449&amp;include_contexts=course_336010)</a>	12am
Wed Feb 22, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=530450&amp;include_contexts=course_336010">Noise II (https://ufl.instructure.com/calendar?event_id=530450&amp;include_contexts=course_336010)</a>	12am
Fri Feb 24, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=530453&amp;include_contexts=course_336010">Antenna noise (https://ufl.instructure.com/calendar?event_id=530453&amp;include_contexts=course_336010)</a>	12am
Mon Feb 27, 2017	 <a href="https://ufl.instructure.com/courses/336010/assignments/3165524">HW #4 (https://ufl.instructure.com/courses/336010/assignments/3165524)</a>	due by 4pm
Mon Feb 27, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=530451&amp;include_contexts=course_336010">Linearity I (https://ufl.instructure.com/calendar?event_id=530451&amp;include_contexts=course_336010)</a>	12am
Wed Mar 1, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=530452&amp;include_contexts=course_336010">Linearity II (https://ufl.instructure.com/calendar?event_id=530452&amp;include_contexts=course_336010)</a>	12am

Date	Details	
Mon Mar 13, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=530448&amp;include_contexts=course_336010">RF system specs (https://ufl.instructure.com/calendar?event_id=530448&amp;include_contexts=course_336010)</a>	12am
Wed Mar 15, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=530463&amp;include_contexts=course_336010">GSM specification example (https://ufl.instructure.com/calendar?event_id=530463&amp;include_contexts=course_336010)</a>	12am
Fri Mar 17, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=530454&amp;include_contexts=course_336010">Transceiver architectures (https://ufl.instructure.com/calendar?event_id=530454&amp;include_contexts=course_336010)</a>	12am
Mon Mar 20, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=530456&amp;include_contexts=course_336010">RXI (https://ufl.instructure.com/calendar?event_id=530456&amp;include_contexts=course_336010)</a>	12am
	 <a href="https://ufl.instructure.com/courses/336010/assignments/3165525">HW #5 (https://ufl.instructure.com/courses/336010/assignments/3165525)</a>	due by 4pm
Wed Mar 22, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=530457&amp;include_contexts=course_336010">RXII (https://ufl.instructure.com/calendar?event_id=530457&amp;include_contexts=course_336010)</a>	12am
Fri Mar 24, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=530458&amp;include_contexts=course_336010">RXIII (https://ufl.instructure.com/calendar?event_id=530458&amp;include_contexts=course_336010)</a>	12am
Mon Mar 27, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=530455&amp;include_contexts=course_336010">TXI (https://ufl.instructure.com/calendar?event_id=530455&amp;include_contexts=course_336010)</a>	12am
Wed Mar 29, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=551838&amp;include_contexts=course_336010">TXII (https://ufl.instructure.com/calendar?event_id=551838&amp;include_contexts=course_336010)</a>	12am
Fri Mar 31, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=545971&amp;include_contexts=course_336010">ADS Q&amp;A (https://ufl.instructure.com/calendar?event_id=545971&amp;include_contexts=course_336010)</a>	12am
	 <a href="https://ufl.instructure.com/calendar?event_id=530465&amp;include_contexts=course_336010">RFIC Packaging (https://ufl.instructure.com/calendar?event_id=530465&amp;include_contexts=course_336010)</a>	12am
Mon Apr 3, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=545970&amp;include_contexts=course_336010">Guest Lecture (https://ufl.instructure.com/calendar?event_id=545970&amp;include_contexts=course_336010)</a>	12am
	 <a href="https://ufl.instructure.com/courses/336010/assignments/3165526">HW #6 (https://ufl.instructure.com/courses/336010/assignments/3165526)</a>	due by 4pm
Wed Apr 5, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=530460&amp;include_contexts=course_336010">Exam review (https://ufl.instructure.com/calendar?event_id=530460&amp;include_contexts=course_336010)</a>	12am
Fri Apr 7, 2017	 <a href="https://ufl.instructure.com/courses/336010/assignments/3165528">Exam #2 (https://ufl.instructure.com/courses/336010/assignments/3165528)</a>	due by 4pm
Mon Apr 10, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=530461&amp;include_contexts=course_336010">Exam recap (https://ufl.instructure.com/calendar?event_id=530461&amp;include_contexts=course_336010)</a>	12am
	 <a href="https://ufl.instructure.com/calendar?event_id=549369&amp;include_contexts=course_336010">SDR (https://ufl.instructure.com/calendar?event_id=549369&amp;include_contexts=course_336010)</a>	12am
Wed Apr 12, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=549371&amp;include_contexts=course_336010">FCC Testing/Equipment (https://ufl.instructure.com/calendar?event_id=549371&amp;include_contexts=course_336010)</a>	12am
Mon Apr 17, 2017	 <a href="https://ufl.instructure.com/calendar?event_id=532316&amp;include_contexts=course_336010">Presentations (https://ufl.instructure.com/calendar?event_id=532316&amp;include_contexts=course_336010)</a>	12am
	 <a href="https://ufl.instructure.com/courses/336010/assignments/3165529">Final Project (https://ufl.instructure.com/courses/336010/assignments/3165529)</a>	due by 4pm

**Date****Details**

Wed Apr 19, 2017

[Presentations \(https://ufl.instructure.com/calendar?event\\_id=532317&include\\_contexts=course\\_336010\)](https://ufl.instructure.com/calendar?event_id=532317&include_contexts=course_336010)

12am



